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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,167	12/11/2001	Jonathan A. Usuka	9080-016-999	3878
20583	7550	08/06/2008		
JONES DAY 222 EAST 41ST ST NEW YORK, NY 10017			EXAMINER DEJONG, ERIC S	
			ART UNIT 1631	PAPER NUMBER
			MAIL DATE 08/06/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/015,167

Applicant(s)

USUKA ET AL.

Examiner

ERIC S. DEJONG

Art Unit

1631

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14, 15, 17, 20-22, 39, 40, 42, 45-47 and 58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14, 15, 17, 20-22, 39, 40, 42, 45-47 and 58 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED OFFICE ACTION

Applicants response filed 04/07/2008 is acknowledged.

Claims 1-13, 16, 18, 19, 23-38, 41, 43, 44, 48-57, and 59-77 are canceled.

Claims 14, 15, 17, 20-22, 39, 40, 42, 45-47, and 58 are pending and are currently under examination.

Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Claim Rejections - 35 USC § 112

The rejection of claims 14, 15, 17, 20-22, 39, 40, 42, 45-47, and 58 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement is withdrawn in view of applicants' argument, filed 04/07/2008.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 14, 15, 17, 20-22, 39, 40, 42, 45-47, and 58 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 14, 15, 17, 20-22, 39, 40, 42, 45-47, and 58 are drawn to methods, related computer system and program products for associating a phenotype with one or more candidate chromosomal region in a genome of a species and, therefore, involves the application of a judicial exception. Regarding inventions involving the application of a judicial exception, said application must be a practical application of the judicial exception that includes either a step of a physical transformation, or produces a useful, concrete, and tangible result (State Street Bank & Trust Co. v. Signature Financial Group Inc. CAFC 47 USPQ2d 1596 (1998), AT&T Corp. v. Excel Communications Inc. (CAFC 50 USPQ2d 1447 (1999)). In the instant claims, there is no step of physical transformation, thus the Examiner must determine if the instant claims include a useful, concrete, and tangible result.

In determining if the claimed subject matter produces a useful, concrete, and tangible result, the Examiner must determine each standard individually. For a claim to be "useful," the claim must produce a result that is specific, and substantial. For a claim to be "concrete," the process must have a result that is reproducible. For a claim to be "tangible," the process must produce a real world result . Furthermore, the claim must be limited only to statutory embodiments.

Claims 14, 15, 17, 20-22, 39, 40, 42, 45-47, and 58 are not limited to producing only a concrete and tangible result. It is acknowledged that the instant claims have been amended to recite "communicating one or more genotypic data structures to a user, a display, a readily accessible computer memory or other computer on a network" (see for example lines 41 and 42 of claim 14). It is further acknowledged that in the previous

Office action, mailed 02/01/2007 indicated that an amendment to the instant claims so as to recite that a result is outputted to a user, a display, a readily accessible computer memory or other computer on a network would be sufficient to overcome the instant rejection. However, the recent decision issued by the Federal Circuit Court of Appeals in *In re Nuijten* (2007) set forth that signals, encompassing the transmission of information, are transitory in nature and do not encompass statutory subject matter. In the instant case, the recited step of "communicating" a result to "a readily accessible computer memory or other computer on a network" does not produce a concrete and tangible result as said embodiments read on the generation of a transitory signal and thus are not concrete and tangible.

For the benefit of applicants, an amendment to the instant claims so as to recite --outputting one or more genotypic data structures to a user or a display-- would be sufficient to overcome the instant rejection. It is further noted that the output of a result to a readily accessible computer memory or other computer on a network would be considered as encompassing non-statutory embodiments.

Claims 39, 40, 42, and 45-47 are each drawn to a "computer program product comprising a computer readable storage medium and a computer program mechanism embedded therein" (see for example lines 2 and 3 of claim 39). The instant specification does not provide a limitation definition for the recited "computer readable storage medium" as encompassing only physical computer readable media. Further, the computer program mechanism as set forth in the instant claims comprises only data and

executable program instructions and is not limited to requiring any physical component. Therefore, the instant claims read on embodiments wherein a computer program is disposed only a signal or electromagnetic carrier wave. As set forth in *In re Nuijten* (see above) signals, encompassing the transmission of information, are transitory in nature and do not encompass statutory subject matter. Therefore, the instant claims are not limited only to statutory embodiments.

For the benefit of applicants, an amendment to the instant claims so as to recite -- a *physical* computer readable storage medium -- (emphasis added) would be sufficient to overcome the instant rejection.

Response to Arguments

Applicant's arguments filed 04/07/2008 have been fully considered but they are not persuasive.

In regards to the rejection of claims under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter, applicants argue that the results of the recited methods are information regarding the chromosomal regions associated with a phenotype and thus present a tangible, concrete, and useful result.

In response, it is reiterated from the instant rejection that the recited embodiment of communicating a result to "a readily accessible computer memory or other computer on a network" does not produce a concrete and tangible result as said embodiments read on the generation of a transitory signal and thus are not concrete and tangible. It is maintained that the accession of computer memory or other computers on a network, as recited in the instant claim, does not provide any tangible (real world) communication of

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a result to a practitioner of the claimed process. Rather, said recited embodiment requires only the transformation of data inside of a general purpose computer that may be used to carry out the recited process and, therefore, produces no tangible result. Further, the recited embodiment wherein the communication of a result to a readily accessible computer memory or other computer on a network reads on the transient embodiment of a signal or carrier wave embodiment that is not considered concrete. *In re Nuijten* (2007). Therefore applicants arguments is not persuasive.

Applicants further argue that a computer readable storage medium necessarily requires a physical object and transitory signals taken alone are not compatible with a common understanding of a "storage medium".

In response, it is not agreed that the generic recitation of "computer readable storage medium" is necessarily limited to a physical object. One of ordinary skill in the art would recognize that carrier waves and signals are a well established medium for carry computer related instructions. See again *In re Nuijten* (2007). Therefore, applicants argument is not persuasive. In view of applicants position that a computer readable storage medium is necessarily requires a physical object, it is reiterated that applicants amend the instant claims to recites a --physical computer readable medium--.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Satagopan et al. (see List of References cited by examiner, mailed 10/19/2004).

Satagopan et al. describes a method for associating a phenotype with one or more candidate chromosomal positions using a multi-locus model (Abstract etc., and page 806, lines 1-2). The method of Satagopan et al. is directed to using phenotypic data for *Brassica napus* (species) wherein "[a]t each marker locus and the putative QTL, associate 1 with one homozygous parent type, -1 with the other homozygous parent type and 0 with the heterozygote" (strains). The phenotypic (flowering time) and genotypic (genetic marker loci) data structures are defined by the linear model

(structure) of equations 1-6 (establish) wherein Tables 1-3 are populated (database) with data from said model. The location of the putative locus, its phenotype and effects can be estimated from said model by assuming an appropriate distribution for the traits (variation) (pages 806-807, QTL Model §, and pages 810-811, The data and model structure). The models are being compared to a correlation value wherein the ratio of marginal probabilities of the two compared models is the Bayes factor (page 809, column 2, lines 29-47), as in instant claim 14, lines 8-9; claim 39, lines 16-17; and claim 46, lines 16-17. Satagopan et al. describes five repeated runs of the chain using normal and multivariate t weighting densities (identified correlations between genotypic data structure and phenotypic data structure, correlation values weighted by a number of components corresponding to the genotypic data structure) (see Figures 2 and 7). Satagopan et al. further disclose the estimate of the location of marker locations plotted against marginal posterior density (X in Figures 2 and 7), a threshold above which marginal posterior density for several marker loci meet a 90% HPD confidence level, which reads on the identification of genotypic data structures that have high correlation values higher than the correlation value for all others (see also Figures 2 and 7).

While Satagopan et al. discloses the above described computational method for associating a phenotype with one or more candidate chromosomal positions using a multi-locus model, Satagopan et al. does not expressly teach A computer program product comprising a computer readable storage medium and computer mechanism embedded therein. However, Regarding computer-related inventions, the MPEP §2106 (VI) states:

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"Reviewing a claimed invention for compliance with 35 U.S.C. 102 and 103 begins with a comparison of the claimed subject matter to what is known in the prior art. See MPEP §2131 - § 2146 for specific guidance on patentability determinations under 35 U.S.C. § 102 and 103. If no differences are found between the claimed invention and the prior art, then the claimed invention lacks novelty and is to be rejected by USPTO personnel under 35 U.S.C. 102. Once differences are identified between the claimed invention and the prior art, those differences must be assessed and resolved in light of the knowledge possessed by a person of ordinary skill in the art. Against this backdrop, one must determine whether the invention would have been obvious at the time the invention was made. If not, the claimed invention satisfies 35 U.S.C. 103."

Factors and considerations dictated by law governing 35 U.S.C. 103 apply without modification to computer-related inventions. Moreover, merely using a computer to automate a known process does not by itself impart nonobviousness to the invention. See *In re Venner*, 262 F.2d 91, 95, 120 USPQ 193, 194 (CCPA 1958). See also *Dann v. Johnston*, 425 U.S. 219, 227-30, 189 USPQ 257, 261 (1976).

Therefore it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to rely on a computer program and system to automate the computational method for associating a phenotype with one or more candidate chromosomal positions using a multi-locus model, as taught Satagopan et al., because using a computer to automate a known process does not by itself impart nonobviousness. Further, one of ordinary skill in the art would have a reasonable expectation of success because the disclosed method of Satagopan et al. requires complex algorithmic procedures and data processing that is typically carried out by computer implementation.

Response to Arguments

Applicant's arguments filed 04/07/2008 have been fully considered but they are not persuasive.

In regards to the rejection of claim 46 under 35 USC 103(a) as being as being unpatentable over Satagopan et al., applicants argue that Satagopan et al. does not teach or suggest “determining a correlation value for a genotypic data structure by a comparison of a phenotypic data structure” nor “determining correlation values for a plurality of genotypic data structure” as recited in claim 46. Applicants further argue that a Bayes factor is a ratio whose value is indicative of whether a given model is more strongly supported by available data than another model, and this is not a correlation value.

In response, it is reiterated from the instant rejection that Satagopan et al. teaches the location of the putative locus (a genotypic data structure), its phenotype and effects can be estimated from said model by assuming an appropriate distribution for the traits (variation) (pages 806-807, QTL Model §, and pages 810-811, The data and model structure). The models are being compared to a correlation value wherein the ratio of marginal probabilities of the two compared models is the Bayes factor (page 809, column 2, lines 29-47), as in instant claim 14, lines 8-9; claim 39, lines 16-17; and claim 46, lines 16-17. It is further noted that neither the instant specification nor the instant claims provide any explicit definition of “a correlation value” that would expressly exclude embodiments such as a Bayes factor. As acknowledged by applicants, a Bayes factor provides a value that is indicative of whether a given model is more strongly supported by available data than another model. Therefore, applicants argument is not persuasive.

Applicants further argue that the approach in Satagopan et al. requires data from progeny of two parents which is not a requirement of claim 46.

In response, it is noted that claim 46 recites the open claim language of a method "comprising" the recited process steps. As such, the instant claims are open to methods that may include additional process steps that are not recited in the instant claims. Therefore applicants argument is not persuasive.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC S. DEJONG whose telephone number is (571)272-6099. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Moran Marjorie can be reached on (571) 272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Eric S DeJong/
Primary Examiner, Art Unit 1631